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CLAIMS

I claim:

1. A magnetic resistance device, comprising a rotatable member adapted to rotate in response to an input, and an automatically variable magnetic resistance arrangement which interacts with the rotatable member to provide resistance to the input, wherein the resistance arrangement is operable to provide an automatically
5 variable non-linear relationship between the speed of the rotatable member and the resistance provided to the input.

2. The resistance device of claim 1, wherein the magnetic resistance arrangement comprises an eddy current resistance mechanism operable to provide resistance to the input.

3. A resistance unit for an exercise device, comprising:

a rotatable member, wherein the rotatable member is rotatable about an axis of rotation;

an electrically conductive member located adjacent the rotatable member;

5 and

one or more magnetic members movably mounted to the rotatable member, wherein the magnetic members are movable relative to the axis of rotation in response to variations in the speed of rotation of the rotatable member;

wherein the one or more magnetic members and the electrically
10 conductive member cooperate to form an eddy current force which resists rotation of the rotatable member, wherein movement of the one or more magnetic members functions to alter the location of the eddy current force relative to the axis of rotation to vary the resistance to rotation of the rotatable member in response to the speed of rotation of the rotatable member.

4. The resistance unit of claim 3, wherein the rotatable member comprises a flywheel mounted to a shaft which in turn is engaged with an input member, and wherein the input member is adapted to be engaged by a bicycle wheel such that the flywheel imparts resistance to rotation of the bicycle wheel.

5. The resistance unit of claim 3 wherein the one or more magnetic members are each located within an open groove associated with the rotatable member,

and further including a retainer positioned over the open groove to retain the magnetic member within the groove.

6. The resistance unit of claim 5 wherein the magnetic member is slidably retained in the widened portion defined by the groove.

7. The resistance unit of claim 5 further comprising a biasing member positioned within a narrowed portion defined by the groove, wherein the biasing member engages the magnetic member to bias the magnetic member inwardly.

8. The resistance unit of claim 3, wherein the electrically conductive member comprises a disc-shaped member located adjacent the rotatable member.

9. The resistance unit of claim 8, further comprising a magnetically attractive member mounted to the disc-shaped member to direct the magnetic flux of the magnetic member through the disc-shaped member.

10. The resistance unit of claim 3, wherein the rotatable member includes a plurality of vanes which circulate air upon rotation of the rotatable member .

11. The resistance unit of claim 10, wherein the rotatable member is contained within a housing having a plurality of openings to allow circulation of air through the housing upon rotation of the rotatable member .

12. The resistance unit of claim 3 wherein electrically conductive member comprises a primary wall located adjacent a side of the rotatable member and an outer flange located outwardly of the rotatable member .

13. The resistance unit of claim 3, wherein each magnet is movably mounted to a radially extending support that extends outwardly from a hub section defined by the rotatable member, wherein each magnet is biased inwardly toward the hub section and is moved outwardly against the inward bias by centrifugal force caused
5 by rotation of the rotatable member.

14. The resistance unit of claim 3 wherein the rotatable member is formed of a non-magnetic material.

15. The resistance unit of claim 14, wherein each magnetic member is maintained in position on the rotatable member by means of a non-magnetic cover arrangement secured to the rotatable member.

16. A bicycle training apparatus comprising:

a) a support frame adapted to support a bicycle having at least one wheel;

and

b) a resistance unit attached to the support frame, wherein the resistance

5 unit includes a roller engageable with a bicycle wheel, a shaft extending outwardly from the roller an electrically conductive member, and a rotatable member attached to the shaft and located adjacent the rotatable member, the rotatable member having a radially outwardly movable magnetic element that interacts with the electrically conductive member to establish a resistive eddy current force upon rotation of the rotatable
10 member, wherein the magnetic member is radially movable in response to the speed of rotation of the rotatable member caused by rotation of the bicycle wheel to resist rotation of the bicycle wheel.

17. The bicycle training apparatus of claim 16, wherein outward movement of the magnetic element is resisted by a biasing member that engages the magnetic element.

18. The bicycle training apparatus of claim 17 wherein the biasing member is a spring.

19. The bicycle training apparatus of claim 16 wherein the rotatable member comprises a flywheel having a number of vanes to circulate air relative to the conductive member.

20. The bicycle training apparatus of claim 19 wherein the vanes are positioned at an angle with respect to the axis of rotation of the rotatable member.

21. A method for providing resistance to a bicycle wheel rotatably secured to a bicycle trainer, the method comprising the steps of:

a) providing a bicycle trainer having a wheel engaging assembly and a resistance unit, the resistance unit including an electrically conductive member, a shaft
5 connected to a wheel-engaging roller and to a rotatable member, the rotatable member including at least one support, the at least one support having at least one slidable magnetic element urged radially inwardly by a biasing member;

b) engaging the wheel with the roller such that the wheel rotatably contacts the roller;

10 c) rotating the wheel to rotate the roller, shaft and rotatable member,
wherein the magnetic element interacts with the conductive member to establish an eddy
current force that resists rotation of the rotatable member and thereby the bicycle wheel,
wherein radial movement of the magnetic element in response to variations in the speed
of rotation of the rotatable member functions to vary the radial position of the eddy
15 current force to vary the degree of resistance to rotation of the rotatable member.

22. In a magnetic resistance unit for an exercise device, wherein the
magnetic resistance unit includes a rotatable member rotatable about an axis of rotation,
the improvement comprising a variable position magnetic arrangement that is operable
to establish an eddy current resistive force which resists rotation of the rotatable
5 member, wherein the variable position magnetic arrangement is operable to vary the
strength of the eddy current resistive force in response to the speed of rotation of the
rotatable member.

23. The improvement of claim 22, wherein the variable position magnetic
arrangement includes one or more magnetic members movably mounted to the rotatable
member, and an electrically conductive member located adjacent the one or more
magnetic members which cooperates with the one or more magnetic members to
5 establish the eddy current resistive force.

24. The improvement of claim 23, wherein the one or more magnetic
members are movable radially outwardly in response to rotation of the rotatable
member, and further comprising a biasing arrangement operable to bias the one or more
magnetic members inwardly.